ON THE PROPOSAL TO ESTABLISH THE DEGREE OF B.SC.
IN THE UNIVERSITY OF TORONTO.

DEGREE IN SCIENCE

n.d.

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The question of establishing the Degree of Bachelor of Science (B.Sc.) which is now under consideration by a Special Committee of the Senate is of sufficient importance to justify a discussion of it by all those who are interested in the development of the University and in keeping its standards in line with those of the majority of the best Universities of the Empire. The Special Committee has asked for a statement setting forth the reasons why the proposal for establishing the Degree has now been made. It has, therefore, been deemed advisable to offer the following representations on the subject.

The reasons for advancing the proposal to establish the Degree of Bachelor of Science may be grouped under the following Divisions:-

I. The pressure of subjects in the present Honour Science Courses leading to the Degree of Bachelor of Arts. This has resulted, in some, of these courses at least, in the reduction of time allotted for instruction in non-scientific subjects to a very minute fraction of the total number of hours exacted.

II. The large variety of Degrees given by the University in Science. Besides the B.A. which is also given though not nominally, for Applied Science, the University of Toronto has established the following degrees in Applied Science: B.A.Sc., B.S.A., B.H.S., B.Sc.F., and B.V.S., the value of which is chiefly only locally known. This is in marked contrast with the usage of all the leading Universities of the Empire.

III. The Fees charged for Courses in the Sciences.
The low fees for instruction in the B.A. for Applied Science Courses keep

down the fees for instruction in the courses leading to B.A.Sc. in the Faculty of Applied Science as compared with the fees charged in the Medical Faculty.

I. The Honour Science Courses leading to the Degree of B.A. demand of the students taking them a number of hours of instruction per week which leaves little or practically no time for the cultivation of general knowledge during the University Course. The total number of hours of instruction in these Honour Courses varies according to the course, ranging from a minimum of 3120 or 30 per week to 2850 or 37 per week. Of these at most about 494 hours throughout the four years, but chiefly in the first year, are given to Latin, English, Mathematics and two foreign languages. In one of these Honour Courses the general subjects do not involve more than 340 hours. When recently attempts were made to introduce into these and other Honour Courses more instruction in subjects of the General Course it was urged that it would of necessity involve a reduction in the time demanded in the Honour work in the class room and laboratory and that such a reduction would seriously diminish the efficiency of the Honour Courses in question.

When, on the other hand, because of the excessive number of hours to which many laboratory courses had grown the Council of the Faculty of Arts decided to establish 32 as the maximum number of hours of instruction per week in any such course it was proposed to effect this reduction in part at least by lessening the number of hours given to instruction in the general subjects. Eventually the Council was persuaded to recommend to the Senate that no student be permitted to enter the Honour Science Courses who has not obtained Honours in English at Matriculation. Honours at Matriculation in any subject permits the student to dispense with the pass requirements of that subject in the first year and thus Honours in English at Matriculation would lessen by 78, or 3 a week, the number of hours demanded of such a student in the first year. The very fact that such a proposition was made and carried in the Faculty Council shows the degree of tension that obtains in those Honour Courses.

The policy of making an Honour Science Course leading to the Degree of B.A. begin in the High School by exacting Honours in English at Matriculation has not yet been proposed for adoption in the Senate but even if it should eventually be accepted it would leave unsolved the problems presented by these Honour Science Courses; the extreme requirements as to number of hours of instruction, and the denial to the student of opportunity to develop or cultivate tastes in such other lines of study as his University environment ought to make possible.

How little reason there is for this denial may be gathered from a consideration of the requirements of other Universities. It suffices to refer to one instance. In a special Science Course leading to the Degree of A.B., in the University of Chicago, 1600 hours only are demanded for the Science subjects while in the corresponding (Honour) Course in Toronto over 2900 hours were exacted last Session.

There is also the lack of uniformity in the Honour Courses. Several of them are so general that though the students devote a very large number of hours per week to them they are unable to obtain a satisfactory grasp of the subjects while in other Courses the curricula are such that the students may spend the Fourth Year in research alone.

, These Courses are consequently not based on a common principle. Several of them exact of the student an intense degree of specialization of study. They all tend to develop at the cost of the students' general training. The proper adjustment of special and general subjects in all Honour Courses leading to the Degree of B.A. is hampered, indeed rendered impossible, because in the Honour Science Courses the fixed policy is to specialize at the expense of subjects of the General Course.

If the B.Sc. degree were established in the University of Toronto the tension referred to would at once abate.

II. The University gives a large number of Degrees in Applied Science. It confers the B.A. on students who have completed the Honour Course in

Chemistry and Mineralogy and who in that course are qualified as professional Chemists. There is also the B.A.Sc., in the Applied Science Faculty for practically the same Course. The B.A.Sc., is given in Civil Engineering, Mining Engineering, Mechanical Engineering, Architecture, Analytical and Applied Chemistry, Chemical Engineering, and Electrical Engineering. The B.S.A. is given in Agriculture. The B.H.S. is established for Household Science. The B.V.S. is given in Veterinary Medicine. There is also the B.Sc.F., recently established, which means, Bachelor of the Science of Forestry. It is to be noted also that in Applied Science the University gives the degrees of Civil Engineer (C.E.) Mining Engineer (M.E.) Mechanical Engineer (M.E.) Electrical Engineer (E.E.) and Chemical Engineer (Chem. E.) .

This is an extraordinary profusion of Degrees in Applied Science and the like of it is found in no other University of the Empire. The nearest but still far distant approach to such a profusion is to be found in the degrees given by the University of Melbourne, Melbourne Australia (see Appendix). It would be defensible if each of these Degrees had the value that comes from age or usage in the University world but their value is largely unknown except to the interested initiated in this Province. The inexpediency from the University point of view of having two Degrees designated B.A.Sc., (often written B.A.S.) and B.S.A. is self evident.

In British and other Colonial Universities the system adopted is in any case simple. In Oxford the B.A. is given in Pure Science and there are no degrees in Applied Science. In Cambridge the same Degree is given in Pure Science and in Engineering and Agriculture amongst the Applied Sciences. Diplomas are awarded for courses in Forestry, Public Health and Agriculture. In the University of London the B.Sc. is given in Pure Science, in Agriculture, Veterinary Science, Engineering, Mining, Metallurgy and Economics. In the Scottish Universities the B.Sc. is conferred on graduation in Pure Science and in Engineering, Sanitary Science, Forestry and Agriculture, (see Appendix). In McGill the B.A. Degree is given in graduation in curricula in which the so-called Liberal Studies and Pure Sciences are combined. The B.Sc. is granted on graduation in Pure as well as in Applied Science (See Appendix).

To follow the usage just indicated in a large number of the British Universities the University of Toronto should have B.Sc. in Pure Sciences, also the B.Sc., (Engineering), the B.Sc., (Chemical Technology), the B.Sc., (Agriculture) the B.Sc. (Forestry), the B.Sc., (Household Science) and the B.Sc., (Veterinary Science). Such a nomenclature would not need explanation and it would mean to the enquirer that the standards at Toronto were at least assimilated to those of a large number of the other Universities of the Empire.

III. The fees for instruction in the Faculty of Applied Science in the University have hitherto been very low compared with the fees imposed in the Faculty of Medicine which are now $150 per annum or $750 in all. In the Faculty of Applied Science the fees should be, if not as high, at least higher than they are now for in that Faculty the cost of instruction is, if not greater than in the Faculty of Medicine, at least as great. Further, as in Medicine, graduation in Applied Science means entrance to a profession. There is, therefore, no duty imposed on the University of providing cheap instruction for a professional calling the only requisite being that the courses leading to that calling should be adequate. One of the difficulties, however, in the way of further raising the fees in Applied Science is the fact that it would involve the elimination of the Course in Applied Chemistry for the Degree of B.A.Sc. If the fees are increased in the Faculty of Applied Science to the amount required in Medicine ($150) students desiring to take a course in Applied Chemistry will enter the B.A. Honour Course in Chemistry and Mineralogy in which the fees do not exceed $60 per year, and in which also the instruction as now provided qualifies the student for the calling of Professional Chemist or Chemical Analyst. The fees for this B.A. Course cannot be increased without raising the fees for the Arts Courses all round and, besides, the terms of University Federation impose a decisive obstacle to such a solution.

The way out of the difficulty suggested is the establishment of the

Degree of B.Sc. in Pure Science as well as in the Applied Sciences and the readjustment of the fees exacted so as to treat impartially two almost equivalent courses leading to a professional calling, one of which is now unduly favoured simply because it is classed as an Arts Course. This would also enable the University to deal evenly with the students in the Faculties of Medicine and Applied Science.

APPENDIX

Showing Degrees and Diplomas granted in Pure and Applied Science by certain British and Colonial Universities other than those of Oxford and Cambridge.

UNIVERSITY OF LONDON

B.Sc. in Pure Science
B.Sc. in Engineering
B.Sc. in Mining
B.Sc. in Metallurgy
B.Sc. in Agriculture
B.Sc. in Veterinary Science
B.Sc. in Economics.

UNIVERSITY OF EDINBURGH

B.Sc. in Pure Science
B.Sc. in Engineering
B.Sc. in Agriculture
B.Sc. in Public Health
B.Sc. in Forestry

UNIVERSITY OF GLASGOW

B.Sc. in Pure Science
B.Sc. in Engineering
B.Sc. in Agriculture
B.Sc. in Public Health

UNIVERSITY OF ABERDEEN

B.Sc. in Pure Science
B.Sc. in Agriculture
Diploma in Public Health

UNIVERSITY OF ST.ANDREWS

B.Sc. in Pure Science
B.Sc. in Engineering

UNIVERSITY OF DUBLIN

B.A. in Arts and Pure Science
B.E. in Engineering (including Mining).
Diploma in Electrical Engineering.
" in Public Health
" in Economics.
" in Agriculture.

VICTORIA UNIVERSITY, MANCHESTER

B.Sc. in Pure Science
B.Sc. in Engineering
B.Sc. in Mining.

UNIVERSITY OF LIVERPOOL

The B.A. for literary, historical and Philosophical courses with Mathematics and a small amount of Science
B. Arch. in Architecture.
B. Sc. in Pure Science (including Mathematics)
B. Sc. in Pure Science with courses in Mechanical and Electrical Engineering.
B. Eng. in Engineering, Mechanical, Electrical and Mining.

UNIVERSITY OF BIRMINGHAM

B.Sc. in Pure Science
B.Sc. in Engineering, Mechanical Civil and Electrical
B.Sc. in Mining
B.Sc. in Metallurgy
B.Sc. in Public Health.

UNIVERSITY OF SYDNEY

B.A. in Arts and Pure Science
B.Sc. in Pure Science
B. E. in Civil Engineering
B. E. in Mining and Metallurgy.
B. E. in Mechanical and Electrical Engineering.
Diploma in Public Health.

UNIVERSITY OF MELBOURNE

B.Sc. in Pure Science
B.C.E. in Civil Engineering.
B.M.E. in Mining Engineering.
B.E.E. in Electrical Engineering.
B.Mech. E. in Mechanical Engineering.
B.V.M. in Veterinary Medicine.
B.A.S. in Agricultural Science.

MCGILL UNIVERSITY

B.A. for Arts and Pure Sciences (Pass and Honours)
B.Sc. for Pure Science.
B.Sc. for Civil Engineering and Surveying, Chemistry, Chemical Engineering, Mechanical Engineering, Electrical Engineering, Metallurgical Engineering, Metallurgy, Mining Engineering and Railways.
B.Arch. in Architecture.

The specific title of the Bachelors degree in Agriculture is not indicated in the last Calendar accessible (for 1908-9).

UNIVERSITY OF THE CAPE OF GOOD HOPE

B.A. in Arts and Pure Science combined.
B.Sc. in Mining Engineering.
Diploma in Electrical Engineering
Diploma in Public Health
Diploma in Economics
Diploma in Agriculture.